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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/921,070	08/02/2001	Joseph C. Barrett	42390.P4934D2	7988

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EXAMINER

CHU, CHRIS C

ART UNIT PAPER NUMBER

2815

DATE MAILED: 04/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n No.

09/921,070

Applicant(s)

BARRETT, JOSEPH C. 

Examiner

Chris C. Chu

Art Unit

2815

-- The MAILING DATE of this communication appears n the cover sheet with the correspondence address --
Period f r Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 February 2004.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disp sition of Claims

- 4) ☒ Claim(s) 16, 17, 20 - 27 and 30 - 42 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 16, 17, 20 - 27 and 30 - 42 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Pri rity under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Request for Continued Examination

1. A request for continued examination (RCE) under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 17, 2004 has been entered. An action on the RCE follows.

Response to Amendment

2. Applicant's amendment filed on February 17, 2004 has been received and entered in the case.

Claim Objections

3. Claim 27 is objected to because of the following informalities: "comer" [sic: corner]. Appropriate correction is required.

Since applicant has not amended the claim objection as indicated in the above paragraph, the objection for claim 27 is maintained.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 16, 17, 20, 24, 25, 30, 34, 35, 38 and 39 are rejected under 35 U.S.C. 102(b) as being anticipated by Murakami.

Murakami discloses in Fig. 4 and Fig. 5 an apparatus comprising:

- a substrate (17);
- a chip (11) mounted on the substrate; and
- a mold cap (14) disposed over the substrate such that the mold cap at least partially covers the chip.
- the mold cap having a plurality of rib-structure extensions (13) extending into each corner section of the substrate (see e.g. Fig. 5),
- the extension extends into the corner section of the substrate without extending to an edge of the substrate.
- the mold cap (14) has chamfered edges (Fig. 3 and 5).

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6. Claims 26, 27, 36 and 37 are rejected under 35 U.S.C. 102(b) as being anticipated by Tokuno.

Tokuno discloses in Fig. 1A and Fig. 1C an apparatus comprising:

- a substrate (2);
- a chip (1) mounted on the substrate; and
- a mold cap (15) disposed over the substrate such that the mold cap at least partially covers the chip.
- the mold cap having a plurality of extensions (21) extending into each corner section of the substrate (see e.g. Fig. 1A),
- the extension extends into the corner section of the substrate without extending to an edge of the substrate.
- each extension being a rounded corner of the mold cap structure (Fig. 1A).

Furthermore, applicant's previously-filed affidavit (paper # 12) does not evidence that applicant had envisioned "rounded corners" nor "extensions not extending to the edge" as early as the April 22, 1997 filing date of Tokuno.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 21, 22, 31, 32, 40 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murakami in view of the applicant's prior art.

Murakami discloses the claimed invention except for a plurality of solder balls on a surface of the substrate opposite the mold cap and the plurality of solder balls on the surface of the substrate in an area directly opposite a chip. However, the applicant's prior art teaches in Fig. 1B a plurality of solder balls (20) on a surface of a substrate (14) opposite the mold cap and plurality of solder balls (20) on the surface of the substrate (14) in an area directly opposite a chip. Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to modify Murakami by using the plurality of solder balls as taught by the applicant's prior art. The ordinary artisan would have been motivated to modify Murakami in the manner described above for at least the purpose of electrically connecting the substrate to a further substrate, such as a PCB, as taught by the prior art.

9. Claims 23, 33 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murakami and the applicant's prior art as applied to claims 16, 21, 24, 31, 34 and 40 above, and further in view of Tokita et al. (U.S. Pat. No. 5, 732, 465).

Murakami, as modified, discloses the claimed invention except for all solder balls on the surface of the substrate being spaced from areas directly opposite an edge of the chip. However, Tokita et al. discloses in Fig. 19 all solder balls (30) on the surface of the substrate (10) being spaced from areas directly opposite an edge of the chip (20). Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to further modify Murakami by using the plurality of solder balls as taught by Tokita et al. The ordinary artisan

would have been motivated to further modify Murakami in the manner described above by Tokita depending only upon conventional design considerations --such as the desired ball pitch/spacing and associated wiring/pad density-- of the particular BGA application intended.

Response to Arguments

10. Applicant's arguments filed on February 17, 2004 have been fully considered but they are either moot in light of the new grounds of rejection or are not persuasive.

On page 9, applicant argues "Murakami does not disclose nor suggest the claimed limitation of a mold cap disposed over the substrate such that the mold cap at least partiality covers the chip, the mold cap having a plurality of extensions each extending into a respective corner section of the substrate, *the extensions extend into the corner sections of the substrate without extending to edges of the substrate.*" This argument is not persuasive. Murakami clearly shows in Fig. 5 the mold cap (14) disposed over the substrate (17) such that the mold cap at least partiality covers the chip (11), and the plurality of extensions (13) of the mold cap that extend into a respective corner section of the substrate. Since Murakami clearly discloses column 5, lines 12 - 16 to form the ring part (12), the connecting parts (13) and the resin package (14) by independent molding processes, the ring part (12) is not a part of the combination of the resin package (14) and the connecting parts (13). Thus, Murakami discloses that the extensions (13) may be formed by a process wherein they are not integral with the ring portion (12), and therefore the extensions extend into the corner sections of the substrate without extending to edges of the substrate.

For the above reason, the rejection is maintained.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chris C. Chu whose telephone number is 571-272-1724. The examiner can normally be reached on 11:30 - 8:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on 517-272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chris C. Chu
Examiner
Art Unit 2815


BRADLEY BAUMEISTER
PRIMARY EXAMINER

c.c.
4/27/04 11:14:30 AM